

ON THE PREVALENCE AND SEVERITY OF EPIDERMAL DISEASES IN COASTAL BOTTLENOSE DOLPHINS IN MONTEREY BAY, CALIFORNIA

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ABSTRACT

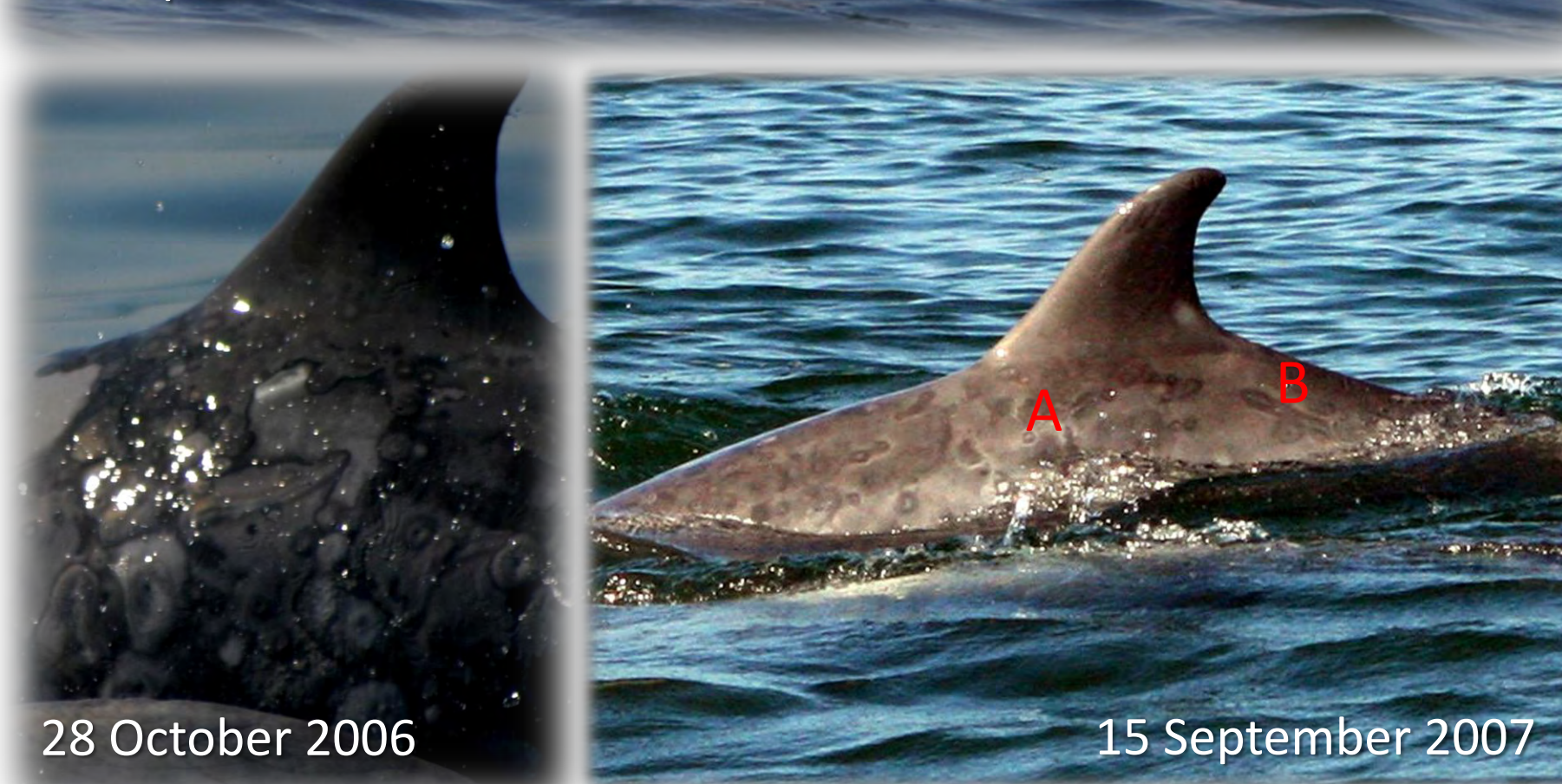
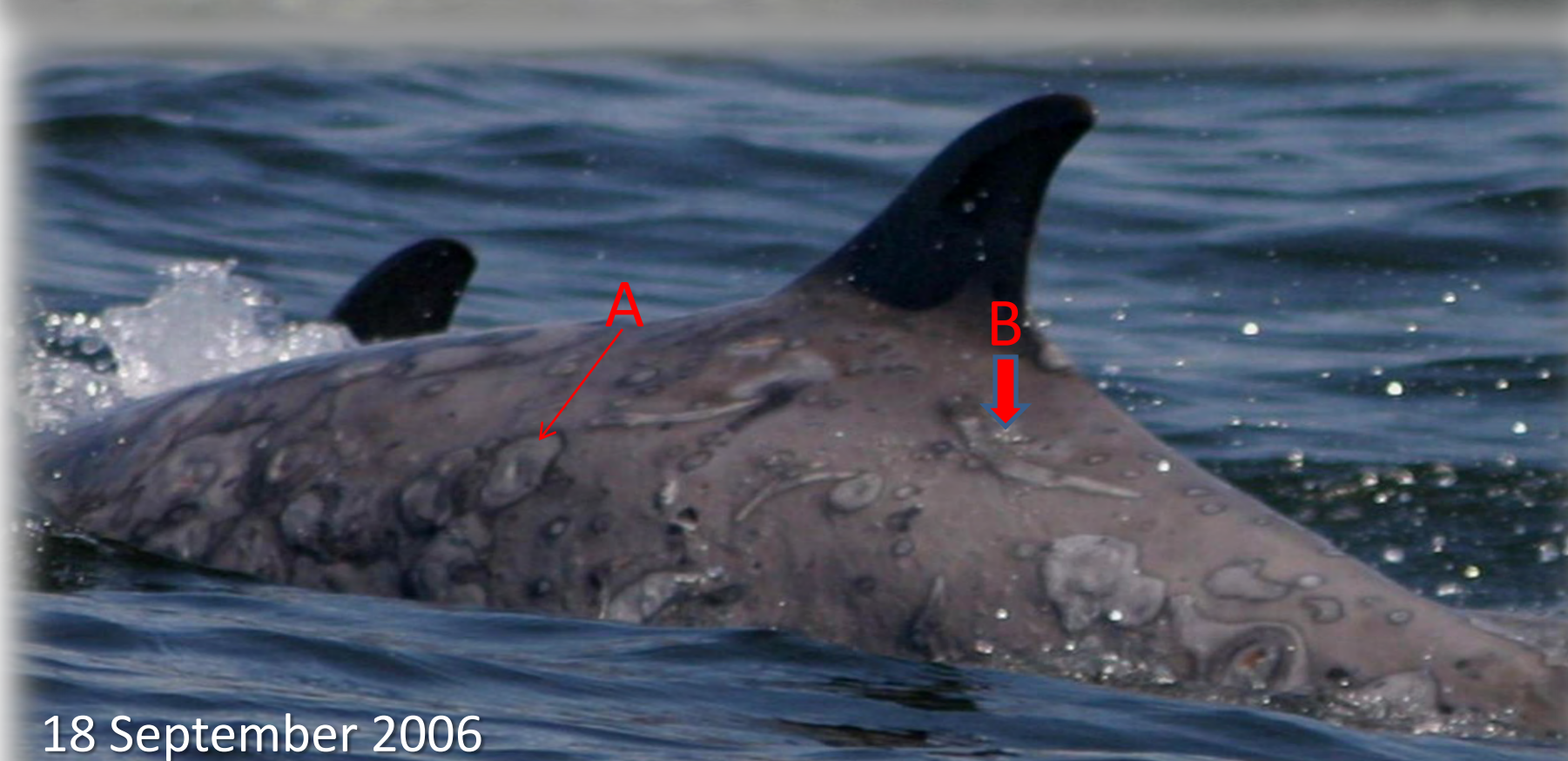
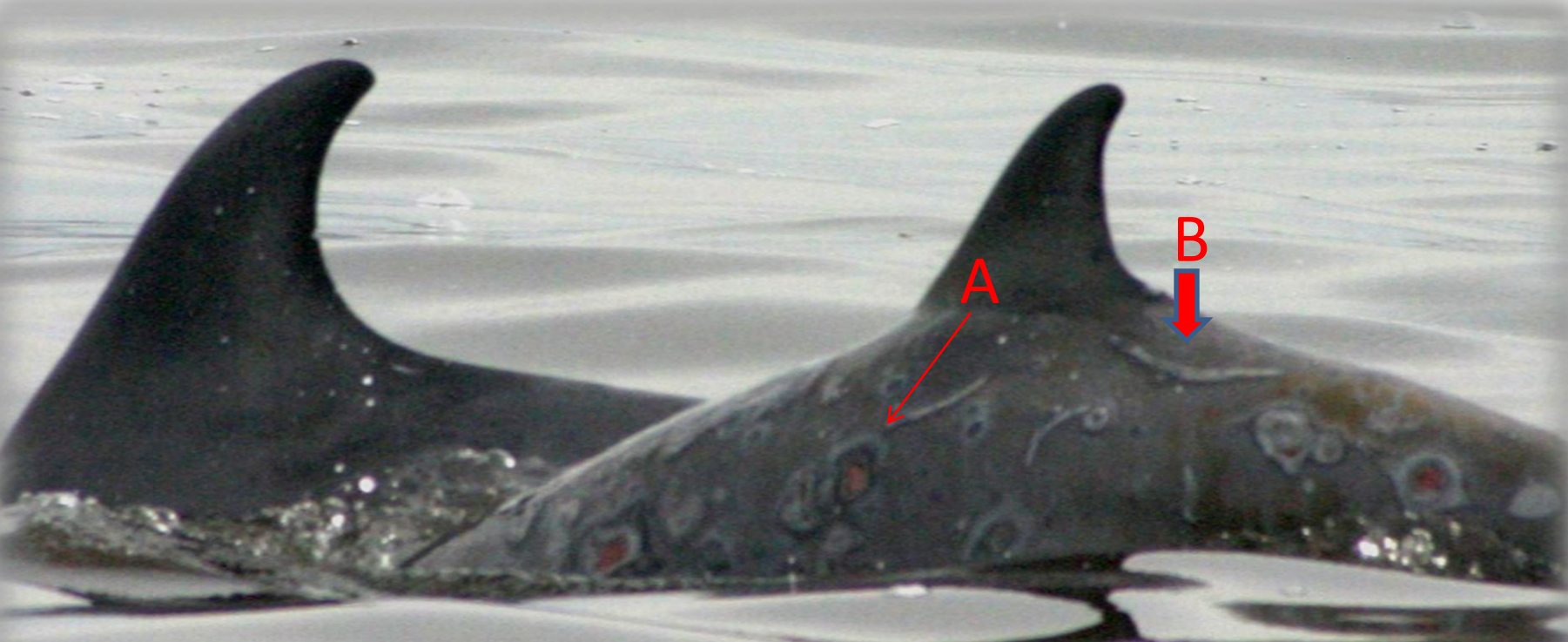
Epidermal disease has been well documented in cetaceans. Bottlenose dolphin populations worldwide are affected by a variety of skin conditions potentially linked to environmental factors such as salinity and temperature, and to anthropogenic factors such as pollution and contaminants. The prevalence (i.e., proportion of examined individuals exhibiting a condition) and severity (i.e., proportion of the body affected) of epidermal disease in California coastal bottlenose dolphins (*Tursiops truncatus gilli*) in Monterey Bay was evaluated between 2006 and 2008. Of 163 unique adult individuals photographically examined, 59% were affected by dark (25%), pale (32%), cloudy (26%), lunar (4%), dark fringe (17%) and white fringe (1%) lesions, and orange hue and/or patch (5%), as described by Wilson et al. (1997). The severity of each type of condition varied from very mild (<5% body cover) to severe (>80% body cover) with 11% of the individuals exhibiting a severe condition. Although affecting over half of the adult population, skin conditions in Monterey Bay had the lowest documented prevalence among bottlenose dolphin populations worldwide. The proportion of males with a severe condition was 68% as opposed to 42% for females. Of 31 calves of known mothers examined, 71% were affected and 16% were classified as severe. Orange hue and/or orange patch, possibly caused by diatoms, were the most prevalent conditions (41% of calves) and generally resolved themselves with time. One calf was first seen on 19 Aug 2006 exhibiting round open and bloody sores similar to those caused by a previously documented calicivirus (serotype Tursiops-1). By September 2006, the sores were covered by light scar tissue and, in September 2007, when the animal was re-sighted, the condition appeared resolved, leaving large discolored areas that could be classified as dark, pale and dark fringe lesions. Causal agents and factors influencing the occurrence of the observed conditions are being investigated.

INTRODUCTION

Bottlenose dolphin populations worldwide are affected by a variety of skin conditions potentially linked to environmental factors such as salinity and temperature, and to anthropogenic factors such as pollution and contaminants. By inhabiting shallow coastal waters just along the land-sea interface, Pacific coastal bottlenose dolphins feed in areas heavily impacted by anthropogenic input and are the top predator in the coastal zone. These dolphins are genetically distinct, ranging along over 1000 km of coastline between San Quentin, Mexico and San Francisco, California. The population is small (300-500 individuals) and inhabits a narrow coastal strip from shore to just beyond the surf line. The conservation status of this population is considered data deficient.

Skin conditions have been considered potential indicators of immune-system health, and lack of immunocompetency has been tied to exposure to contaminants and other pollutants. The long-term monitoring of bottlenose dolphin skin conditions along the California coast is a potentially important indicator of ecosystem health and understanding the nature of such conditions will further elucidate the correlation between the conditions and environmental health.

DOCUMENTATION OF CALF HEALING FROM UNIDENTIFIED SKIN CONDITION



HEALER was seen for the first time with its mother Marea in August 2006 as a juvenile dolphin with a severe skin condition. The round and bloody sores that afflicted its entire body, excepting the dorsal fin, were covered by a thick scab of skin approximately two weeks later. One year later (2007), scarring from the sores was still evident; but by the following year (2008), the condition had cleared leaving only light scars. In 2008, Healer left its mother to start life on its own.

METHODS

SURVEYS

- Conducted boat-based linear surveys in Monterey Bay, California by traveling parallel to the shoreline just outside the surf zone, the preferred habitat of coastal bottlenose dolphins.

PHOTO-ID

- Dolphins photographed using digital technology (Canon 30 and 40D and Canon 100-400mm Image Stabilized zoom lens);
- Pictures of the side of the dorsal fin and body taken.

IMAGE SELECTION

- All images in photo-identification catalogue analyzed for clarity, focus, exposure and parallax;
- Images classified as excellent if: (1) image perfectly in focus; (2) both dorsal fin and other parts of body visible in detail; (3) animal occupied at least ¼ of frame; and (4) side of body parallel to camera;
- Once images met above criteria, selected for each known dolphin in the catalogue;
- Only if no such images available, were alternative photos considered. However, mandatory that criteria (1) and (2) were always met.

LESION CLASSIFICATION

- Wilson et al. (1997) provided the framework for a classification of skin lesions in bottlenose dolphins based on photographic documentation (see photos on right side for lesion classification).

LESIONS' PREVALENCE

- Visible areas of body inspected for occurrence of skin conditions using classification by Wilson et al. (1997).

LESIONS' SEVERITY

- To assess severity, a relative scale was used by estimating the percent of skin affected by the condition for the visible areas of the body in each photo.

RESULTS

SURVEYS

- Aug - Oct 2006-2008: 88 coastal surveys in Monterey Bay, 34 in 2006, 31 in 2007 and 23 in 2008.

PHOTO-ID

- 163 adult bottlenose dolphins identified: 40 females, 22 males and 101 undetermined;
- 32 calves of known mothers identified;
- 147 dolphins seen on multiple occasions.

LESIONS' PREVALENCE

- 195 pictures analyzed for skin conditions;
- 96 adults affected by one (37) or multiple (59) skin conditions;
- all types of lesions described by Wilson et al. (1997) were found (see pie chart).

LESIONS' SEVERITY

- 11% of the individuals exhibited a severe condition;
- Severity appeared disproportionately high in males (68%).

CALVES

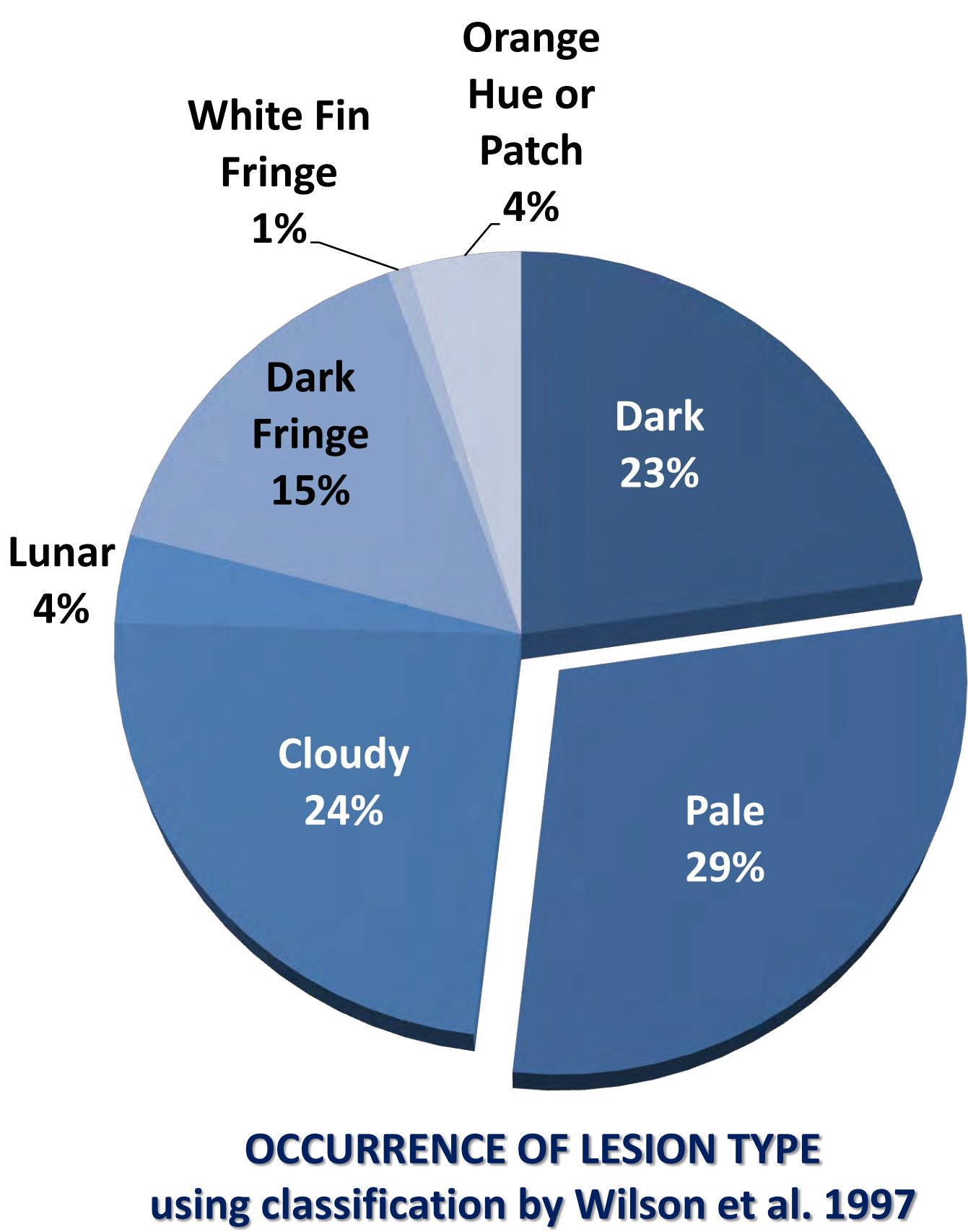
- 31 calves of known mothers examined;
- 71% calves affected;
- 16% classified as severe.;
- Orange hue and/or orange patch, 41% of calves) and generally resolved themselves with time.

REFERENCES

Wilson, B., P.M. Thompson and P.S. Hammond. 1997. Skin lesions and physical deformities in bottlenose dolphins in the Moray Firth: population prevalence and age-sex differences. *Ambio* 26(4), 243-247.

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OCCURRENCE OF LESION TYPE using classification by Wilson et al. 1997